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EXAMINER	
THOMPSON, JAMES A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/024,000	SUZUKI, HIROYUKI	
	Examiner	Art Unit	
	James A. Thompson	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 05 October 2009 have been fully considered but they are not persuasive.

Regarding page 8, lines 1-12: Applicant's arguments with regard to claims 1-19 have been fully considered by Examiner and are addressed below. Newly added claim 20 has been fully considered by Examiner and is fully addressed in the prior art rejection below.

Regarding page 8, line 13 to page 9, line 12: *Applicant argues* that Kim (US-5,754,684) does not disclose a discriminator that discriminates whether or not a region that includes the target pixel is a character region in a halftone dot image based on the count result of the first counter and the count result of the second counter, but rather teaches that the area is either a text area or a screen dot area, and not a text area within a screen dot area.

Examiner replies that claim 1 does **not** recite discriminating whether or not a region that includes the target pixel is a character region in a screen dot area, but rather recites discriminating whether or not a region that includes the target pixel is a character region in a halftone dot image. The entire image is a halftone dot image containing screen dot areas and text areas. Thus, the discriminator determines for each region of the halftone dot image if the region is a screen dot area or a

text area. Therefore, the specifically recited language of claim 1 is anticipated by Kim, as well as the similarly recited language in claims 8 and 14.

Regarding page 9, line 13 to page 10, line 13: *Applicant argues* that the peak counter of Kim cannot be replaced with the counter of Fujiwara (US-4,813,078), nor do the thresholds taught by Fujiwara relate to Kim.

Examiner replies that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Examiner has not proposed replacing the counter of Kim with the counter of Fujiwara. Rather, the teachings of Fujiwara would have suggested to one of ordinary skill in the art at the time of the invention how the counter of Kim could be modified. Kim already teaches counting peak pixels to determine if the area is a screen dot area or a text area, and applies the use of thresholds, such as shown in figures 3A-5D of Kim. One does not have to fully incorporate the counter of Fujiwara to realize that one can simply apply separate thresholds for the first counter of Kim and the second counter of Kim to determine if the target pixel is a character.

Regarding page 10, line 14 to page 11, line 14: Newly added claim 20 is fully addressed in the prior art rejections set forth below.

Regarding page 11, lines 15-18: The rejections of claims 1-19 are maintained. The grounds of rejection required for claim 20 have been necessitated by the addition of claim 20. Thus, the present action is made final.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5, 6, 8, 12, 14 and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim (US-5,754,684).

Regarding claim 1: Kim discloses an image processing apparatus (figure 2 of Kim) comprising: a halftone characteristic detecting section (figure 2(21) of Kim) that detects a halftone dot characteristic indicative of a halftone dot in image data (column 4, lines 4-5 of Kim); a first counter (figure 2(25) of Kim) that counts the number of halftone dot characteristics that exist in a first region including a target pixel from among halftone dot characteristics detected by the halftone dot characteristic detecting section (column 4, lines 5-8 of Kim); an

edge pixel detecting section (figure 2(22) of Kim) that detects a pixel belonging to an edge region based on image data (column 4, lines 8-9 of Kim); a second counter (figure 2(26) of Kim) that counts the number of edge pixels that exist in a second region including the target pixel from among edge pixels detected by the edge pixel detecting section (column 4, lines 9-13 of Kim); and a discriminator (figure 2(29) of Kim) that discriminates whether or not a region that includes the target pixel is a character region in a halftone dot image based on the count result of the first counter and the count result of the second counter (column 4, lines 20-22 of Kim).

Regarding claim 5: Kim discloses a correction unit (figure 2(50) of Kim) that corrects image data based on a discrimination result of the discriminator (column 5, line 66 to column 6, line 24 of Kim).

Regarding claim 6: Kim discloses that the halftone dot characteristic detecting section contains a filter that detects isolate points as halftone dot characteristics (column 4, lines 36-40 of Kim – *peak pixel in NxN pixel local region would be an isolate point*).

Regarding claim 8: Kim discloses an image processing apparatus (figure 2 of Kim) comprising: a first discrimination unit (figure 2(21) of Kim) that discriminates whether or not each pixel of image data has a halftone dot characteristic indicative of a characteristic of a halftone dot image by using a first filter (column 4, lines 4-5 and lines 36-40 of Kim); a second

discrimination unit (figure 2(22) of Kim) that discriminates whether or not each pixel of image data is a pixel that belongs to an edge region by using a second filter (column 4, lines 8-9 and lines 41-48 of Kim); a first counter (figure 2(25) of Kim) that counts the number of halftone dot characteristics that exist in a first pixel matrix consisting of a plurality of pixels containing a target pixel based on the discrimination result of the first discrimination unit (column 4, lines 5-8 of Kim); a second counter (figure 2(26) of Kim) that counts the number of edge pixels that exist in a second pixel matrix consisting of a plurality of pixels containing the target pixel based on the discrimination result of the second discrimination unit (column 4, lines 9-13 of Kim); a discrimination unit (figure 2(29) of Kim) that discriminates whether or not a region that includes the target pixel is a character region in a halftone dot image based on the count result of the first counter and the count result of the second counter (column 4, lines 20-22 of Kim); and an image processing unit (figure 2(50) of Kim) that processes image data based on the discrimination result of the discrimination unit (column 5, line 66 to column 6, line 24 of Kim).

Regarding claim 12: Kim discloses that the first filter detects isolate points, and the first discrimination unit detects the isolation points as halftone dot characteristics (column 4, lines 36-40 and lines 61-65 of Kim – *peak pixel in NxN pixel local region would be an isolate point*).

Regarding claim 14: Kim discloses an image processing method comprising: a step 1 of discriminating whether or not each pixel of image data has a halftone dot characteristic indicative of a characteristic of a halftone dot image (column 4, lines 4-5 of Kim) and discriminating whether or not each pixel of image data is an edge pixel that belongs to an edge region (column 4, lines 8-9 of Kim); a step 2 of counting the number of halftone dot characteristics that exist in a first pixel matrix consisting of a plurality of pixels including a target pixel based on the discrimination result in the step 1 (column 4, lines 5-8 of Kim) and counting the number of edge pixels that exist in a second pixel matrix consisting of a plurality of pixels including the target pixel (column 4, lines 9-13 of Kim); a step 3 of discriminating whether or not a region that includes the target pixel is a character region in a halftone dot image based on the number of halftone dot characteristics and the number of edge pixels counted in the step 2 (column 4, lines 20-22 of Kim); and a step 4 of processing image data based on the discrimination result in the step 3 (column 5, line 66 to column 6, line 24 of Kim).

Regarding claims 17 and 18: Kim discloses that the first counter determines whether or not the target pixel in the first region belongs to a halftone dot region based on the count (column 4, lines 5-8 and lines 36-41 of Kim).

Regarding claim 19: Kim discloses that the number of halftone dot characteristics are counted to determine whether or

not the target pixel in the first pixel matrix belongs to a halftone dot region (column 4, lines 5-8 and lines 36-41 of Kim).

Regarding claim 20: Kim discloses an image processing apparatus (figure 2 of Kim) comprising: a halftone dot characteristic detecting section (figure 2(21) of Kim) that detects isolation points as a halftone dot characteristic indicative of a halftone dot in image data (figure 6B; column 2, lines 26-31; and column 4, lines 4-5 and lines 32-35 of Kim – *halftone dot pixels are isolated pixels, unlike edge pixels which are a connected series of pixels*); a first counter (figure 2(25) of Kim) that counts the number of isolation points that exist in a first region including a target pixel from among isolation points detected by the halftone dot characteristic detecting section (column 4, lines 5-8 and lines 32-35 of Kim); an edge pixel detecting section (figure 2(22) of Kim) that detects a pixel belonging to an edge region based on image data (column 4, lines 8-9 of Kim); a second counter (figure 2(26) of Kim) that counts the number of edge pixels that exist in a second region including the target pixel from among edge pixels detected by the edge pixel detecting section (column 4, lines 9-13 of Kim); and a discriminator (figure 2(29) of Kim) that discriminates whether or not a region that includes the target pixel is a character region in a halftone dot image based on the count result of the first counter and the count result of the second counter (column 4, lines 20-22 of Kim).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US-5,754,684) in view of Matsukubo (US-6,504,949).

Regarding claim 2: Kim does not disclose expressly that the edge pixel detecting section contains an edge detector that detects an edge quantity and detects an internal edge pixel such that a positive edge detection quantity has been detected by the edge detector.

Matsukubo discloses an edge detector that detects an edge quantity and detects an internal edge pixel such that a positive edge detection quantity has been detected by the edge detector (figures 29A-30E and column 14, lines 46-63 of Matsukubo).

Kim and Matsukubo are combinable because they are from the same field of endeavor, namely the recognition and processing of edge and edge-type image regions in digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically detect an edge quantity and internal edge pixels, as taught by Matsukubo. The suggestion

for doing so would have been that specifying internal edge pixels will better define a character or line detected, especially characters or line graphics with interior shapes, such as the letters "A" and "R". Therefore, it would have been obvious to combine Matsukubo with Kim to obtain the invention as specified in claim 2.

Regarding claim 9: Kim does not disclose expressly that the second discrimination unit contains a discriminator that discriminates whether an edge region is an internal edge region or an external edge region, and pixels in an edge region the discriminator has discriminated as an internal edge region are discriminated as edge pixels.

Matsukubo discloses discriminating whether an edge region (figure 29E and figure 30E of Matsukubo) is an internal edge region (figure 29E(right-side curve of black pixels) and figure 30E(inside border lines of "A" character) of Matsukubo) or an external edge region (figure 29E(left-side curve of black pixels) and figure 30E(outside border lines of "A" character) of Matsukubo), and pixels in an edge region that has been discriminated as an internal edge region are discriminated as edge pixels (column 14, lines 46-54 of Matsukubo).

Kim and Matsukubo are combinable because they are from the same field of endeavor, namely the recognition and processing of edge and edge-type image regions in digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically determine and

discriminate between internal and external edge pixels, as taught by Matsukubo. The suggestion for doing so would have been that specifying internal edge pixels will better define a character or line detected, especially characters or line graphics with interior shapes, such as the letters "A" and "R". Therefore, it would have been obvious to combine Matsukubo with Kim to obtain the invention as specified in claim 9.

6. Claims 3, 4, 7, 10, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US-5,754,684) in view of Fujiwara (US-4,813,078).

Regarding claims 3 and 10: Kim discloses that the discriminator discriminates that a target pixel belongs to an edge region in a halftone dot image (column 4, lines 8-9 of Kim).

Kim does not disclose expressly that the discriminator discriminates that a target pixel belongs to a *character* region in the case that the count value of the first counter is smaller than a first threshold and the count value of the second counter is greater than a second threshold.

Fujiwara discloses that a discriminator discriminates that a target pixel belongs to a character region in a binary dot image (halftone dot image, *as per* the teachings of Kim) in the case that the count value of the first counter is smaller than a first threshold (figures 10a-10b and column 6, lines 35-48 of Fujiwara) and the count value of the second counter is greater than a second threshold (figure 6 and column 6, lines 6-14 of Fujiwara).

Kim and Fujiwara are combinable because they are from the same field of endeavor, namely the detection and selective processing of digital image data based on the regional characteristics of the digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use separate thresholds for the first count and the second count in discriminating the target pixel and determining if the target pixel is a character. The motivation for doing so would have been to discriminate character image data from background image data, thus facilitating the recognition of the detected characters (column 6, lines 35-55 of Fujiwara). Therefore, it would have been obvious to combine Fujiwara with Kim to obtain the invention as specified in claims 3 and 10.

Regarding claims 4 and 11: Kim does not disclose expressly a continuity detecting section that detects whether or not an edge has continuity, wherein the discriminator discriminates whether or not the target pixel belongs to a character region in a halftone dot image taking into consideration a detection result of the continuity detecting section.

Fujiwara discloses a continuity detecting section that detects whether or not an edge has continuity, wherein the discriminator discriminates whether or not the target pixel belongs to a character region in a binary dot image (halftone dot image, *as per* the teachings of Kim) taking into consideration a detection result of the continuity detecting section (figures 8a-8b and column 5, line 64 to column 6, line 15 of Fujiwara).

Kim and Fujiwara are combinable because they are from the same field of endeavor, namely the detection and selective processing of digital image data based on the regional characteristics of the digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to detect continuity and use the continuity detection to determine if the target pixel is in a character region. The motivation for doing so would have been to discriminate character image data from background image data, thus facilitating the recognition of the detected characters (column 6, lines 35-55 of Fujiwara). Therefore, it would have been obvious to combine Fujiwara with Kim to obtain the invention as specified in claims 4 and 11.

Regarding claim 7: Kim does not disclose expressly that the number of pixels in the first region is greater than the number of pixels in the second region.

Fujiwara discloses that the number of pixels in the first region (figure 7a of Fujiwara) is greater than the number of pixels in the second region (e.g., figure 8a(F) of Fujiwara - *an entire image is larger than one of a plurality of sub-regions of the same image*).

Kim and Fujiwara are combinable because they are from the same field of endeavor, namely the detection and selective processing of digital image data based on the regional characteristics of the digital image data. At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to use different region sizes for determining halftone dot regions and character regions. The motivation for doing so would have been that pixel value distribution for a character region and a halftone dot region are different, and would thus be more readily distinguished by using differently sized regions. Therefore, it would have been obvious to combine Fujiwara with Kim to obtain the invention as specified in claim 7.

Regarding claim 13: Kim does not disclose expressly that the first pixel matrix is larger than the second pixel matrix.

Fujiwara discloses that the first pixel matrix (figure 7a of Fujiwara) is larger than the second pixel matrix (e.g., figure 8a(F) of Fujiwara - *an entire image is larger than one of a plurality of sub-regions of the same image*).

Kim and Fujiwara are combinable because they are from the same field of endeavor, namely the detection and selective processing of digital image data based on the regional characteristics of the digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use different region sizes for determining halftone dot regions and character regions. The motivation for doing so would have been that pixel value distribution for a character region and a halftone dot region are different, and would thus be more readily distinguished by using differently sized regions. Therefore, it would have been obvious to combine

Fujiwara with Kim to obtain the invention as specified in claim 13.

7. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US-5,754,684) in view of Kumashiro (US-5,341,227).

Regarding claim 15: Kim does not disclose expressly that the correction unit applies edge enhancement processing if the target pixel is in an character region in a halftone dot image.

Kumashiro discloses that the correction unit applies edge enhancement processing if the target pixel is in an character region in an image (halftone dot image, *as per* the teachings of Kim) (figure 2(13) and column 3, lines 51-55 of Kumashiro).

Kim and Kumashiro are combinable because they are from the same field of endeavor, namely the detection and selective processing of digital image data based on the regional characteristics of the digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply edge enhancement to a detected edge or character region, as taught by Kumashiro. The motivation for doing so would have been to provide an improved output image with respect to the edge regions. Therefore, it would have been obvious to combine Kumashiro with Kim to obtain the invention as specified in claim 15.

Regarding claim 16: Kim does not disclose expressly that the correction unit applies smoothing if the target pixel is in a region in a halftone dot image that is not a character region.

Kumashiro discloses that the correction unit applies smoothing if the target pixel is in a region in a halftone dot image that is not a character region (figure 2(14) and column 3, lines 51-55 of Kumashiro).

Kim and Kumashiro are combinable because they are from the same field of endeavor, namely the detection and selective processing of digital image data based on the regional characteristics of the digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply smoothing to the regions that are not character regions, as taught by Kumashiro. The motivation for doing so would have been to provide an improved output image with respect to the pictoral and/or halftone regions. Therefore, it would have been obvious to combine Kumashiro with Kim to obtain the invention as specified in claim 16.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is (571)272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward L. Coles can be reached on 571-272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James A Thompson/
Primary Examiner
Art Unit 2625

23 December 2009